

## PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-231722

(43)Date of publication of application : 02.09.1998

(51)Int.Cl.

F01N 3/20

F01N 3/24

F01N 3/24

F01N 7/10

(21)Application number : 09-052283

(71)Applicant : AICHI MACH IND CO LTD

(22)Date of filing : 19.02.1997

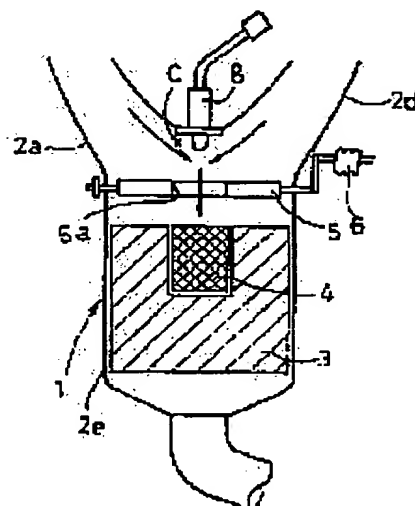
(72)Inventor : OIWA HIROYUKI

## (54) EXHAUST MANIFOLD

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To activate a catalyst rapidly, and improve purifying performance by arranging a valve having a center hole on an upstream side of the catalyst in an exhaust manifold freely to open and close, and arranging a center catalyst having fine cell density on the center part of the catalyst.

**SOLUTION:** A valve 5 provided on a part of a muffler part C upstream from a catalyst 3 is formed on a center part by penetrating a center hole 5a, and is constituted freely to open and close in an exhaust manifold 1. A center catalyst 4 having a fine cell density of a carrier arranged in a fitting condition arranged in a recessed part 3a formed upstream from the catalyst 3, and the center hole 5a, are arranged on a center part matched with each other. Since exhaust gas which is collected from each cylinder of an engine in the muffler part C, collides with the vicinity of the muffler part C in the way of passing the center hole 5a at the time of closing the valve 5, an exhaust temperature is raised, and the exhaust gas collides with the center catalyst 4 concentrically. It is thus possible to improve purifying performance of exhaust gas since the center catalyst 4 is reacted rapidly and is activated in an early stage.



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(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開平 10 - 231722

(43) 公開日 平成 10 年 (1998) 9 月 2 日

(51) Int. Cl.	識別記号	序内整理番号	F I	技術表示箇所
F01N 3/20	ZAB		F01N 3/20	E
3/24			3/24	C
	ZAB			N
7/10	ZAB		7/10	F
			審査請求	未請求
			請求項の数	1 F D (全 4 頁)

(21) 出願番号 特願平 9 - 52283

(22) 出願日 平成 9 年 (1997) 2 月 19 日

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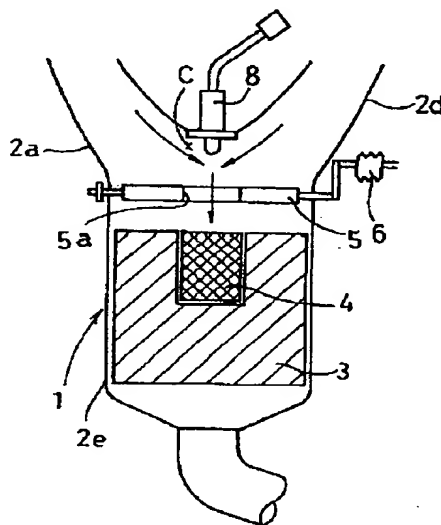
(74) 代理人 弁理士 清水 義久

(54) 【発明の名称】 エキゾーストマニホールド

(57) 【要約】

【目的】 触媒不活性時に触媒を早期に活性化させることを目的とする。

【構成】 触媒 3 を内装したエキゾーストマニホールド 1 内の触媒 3 の上流側に、中央孔 5a を有するバルブ 5 を開閉可能に設け、触媒 3 の中央部には、セル密度の細かい中央触媒 4 を設けて構成する。



## 【特許請求の範囲】

【請求項 1】 触媒を内装してなるエキゾーストマニホールド内の前記触媒の上流側に、中央孔を有するバルブを開閉可能に設けるとともに、前記触媒の中央部にセル密度の細かい中央触媒を設けたことを特徴とするエキゾーストマニホールド。

## 【発明の詳細な説明】

## 【 0 0 0 1 】

【産業上の利用分野】 この発明は、エキゾーストマニホールドの改良に関するものである。

## 【 0 0 0 2 】

【従来の技術及びその課題】 従来、エキゾーストマニホールドは図 7 の概略図で示すように、枝管 2 a、2 d の集合部 C の下流側に形成された収納部 2 e 内に触媒 3 が内装されており、集合部 C には O：センサ 8 が設けられており、各シリンダからの排気ガスは集合部 C で一度集合された後、触媒 3 の手前で拡散されて触媒 3 内を通過するように構成されており、従来構造では、排気ガスが満遍なく前記触媒 3 の全域に亘って当たるように構成されているため、触媒 3 の温度上昇に時間がかかり、触媒活性が遅くなり、排気ガスの浄化性能が劣るという問題点があった。なお、前記触媒 3 を早期に活性化させるために、図 8 に示すように触媒 3 の外周にヒーター 5 1、5 1 を設けた構造のものも存在するが、しかしこのような構造では短時間で触媒 3 を活性化させるほどの熱量は得にくく、また、ヒーター 5 1 を作動させるために多大な電気量を要し、全体が大掛かりな装置となってしまうという問題点があった。

## 【 0 0 0 3 】

【課題を解決するための手段】 本発明は上記従来の問題点に鑑み案出したものであって、触媒を素早く活性化させ浄化性能を向上させることのできるエキゾーストマニホールドを提供せんことを目的とし、その要旨は、触媒を内装してなるエキゾーストマニホールド内の前記触媒の上流側に、中央孔を有するバルブを開閉可能に設けるとともに、前記触媒の中央部にセル密度の細かい中央触媒を設けたことである。

## 【 0 0 0 4 】

【実施例】 以下、本発明の実施例を図面に基づいて説明する。図 1 は、エキゾーストマニホールド 1 の概略構成図であり、エキゾーストマニホールド 1 の上流側は各エンジンの気筒に接続された枝管 2 a、2 b、2 c、2 d を形成しており、各枝管 2 a、2 b、2 c、2 d は集合部 C で集合されて、この部分には O：センサ 8 が設けられたものとなっており、その下流側の収納部 2 e 内に触媒 3 が内装されたものとなっているが、本例では、この触媒 3 の上流側の前記集合部 C の部分にバルブ 5 が開閉可能に設けられており、バルブ 5 は図 4 の上面図で示すように、中央部に中央孔 5 a が貫通形成されており、接続されたシャフト 7 をアクチュエーター 6 を介し回転さ

せることによりエキゾーストマニホールド 1 内で開閉できるように構成されている。

【 0 0 0 5 】 また、本例における触媒 3 の上面側には図 5 の上面図で、また図 6 の拡大断面図で示すように、凹部 3 a が形成されており、この凹部 3 a 内に中央触媒 4 が嵌め込み状に設けられたものとなっており、この中央触媒 4 は担体のセル密度を細かくした構造に形成したものであり、この中央触媒 4 と前記バルブ 5 の中央孔 5 a は整合する中央位置に配置されたものとなっている。

10 【 0 0 0 6 】 このような構造において、エンジンの各気筒から排出された排気ガスは枝管 2 a、2 b、2 c、2 d を通り集合部 C で集合されるが、図 1 の状態ではバルブ 5 が閉止されているため、排気ガスは中央孔 5 a を通過しようとして集合部 C の付近へ衝突することとなり、衝突により排気温度が上昇することとなり、中央孔 5 a を通過して排気ガスは集中的に中央触媒 4 に衝突する。これによりセル密度の細かい中央触媒 4 が素早く反応して、中央触媒 4 が早期に活性化し、これにより排気ガスを早期に浄化して浄化性能が向上することとなる。従って、触媒 3 が不活性時にも中央触媒 4 が早期に活性化されて、良好な浄化性能を早期に達成することができるものとなる。

20 【 0 0 0 7 】 また、触媒 3 の温度も上昇し、触媒 3 が活性化された時には、図 2 に示すようにアクチュエーター 6 を介しバルブ 5 が開かれて、この図 2 の状態では、排気ガスの流れ方向にバルブ 5 が起立されるため、図 3 の上面図で示すようにバルブ 5 が仕切り壁となって、図 3 のようにエンジンの各気筒から枝管 2 a、2 b、2 c、2 d を通して排出された排気ガスの集合部 C での互いの干渉を良好に防止することができるものとなり、集合部 C では排気ガスの衝突が緩和されて排気損失が極めて小さくなり、排気ガスはバルブ 5 に沿って下流側の触媒 3 の全域に亘り均一に当たり、触媒 3 の全域を通過することとなるため、触媒 3 に満遍なく排気ガスが当たり浄化性能が向上するものとなる。

30 【 0 0 0 8 】 従って、本例では、触媒 3 の不活性時には図 1 のように、バルブ 5 を閉止させて集合部 C で排気ガスを衝突させ、排気ガスの温度を上昇させて中央孔 5 a を通過させて中央触媒 4 に排気ガスを当て、早期に中央触媒 4 を活性化させて排気ガスを浄化させることができるとともに、触媒 3 の活性時には図 2 のように、バルブ 5 を開けて各気筒からの排気ガスの干渉を防いで排気損失を低減させ、エンジンの出力の低下を防止して触媒 3 の全域に満遍なく排気ガスを当てて浄化性能を向上させることができるものとなる。

## 【 0 0 0 9 】

【発明の効果】 本発明のエキゾーストマニホールドは、触媒を内装してなるエキゾーストマニホールド内の前記触媒の上流側に、中央孔を有するバルブを開閉可能に設けるとともに、前記触媒の中央部にセル密度の細かい中

中央触媒を設けたことにより、触媒の不活性時にはバルブを閉じて排気ガスを中央孔に集中させて、中央触媒に集中的に排気ガスを当て、中央触媒を早期に活性化させて良好に排気ガスを浄化させることができ、また、触媒の活性時にはバルブを開けて排気損失を低減させた状態で触媒の全域に満遍なく排気ガスを当てて浄化性能を向上させることができる効果を有する。

【図面の簡単な説明】

【図 1】バルブの閉止状態におけるエキゾーストマニホールドの断面構成図である。

【図 2】バルブの開状態におけるエキゾーストマニホールドの断面構成図である。

【図 3】バルブの開時の上面図である。

【図 4】バルブの上面拡大図である。

【図 5】触媒の上面拡大図である。

【図 6】中央触媒の配置状態を示す断面拡大である。

【図 7】従来のエキゾーストマニホールドの概略構成図である。

【図 8】さらに異なる従来のエキゾーストマニホールドの概略構成図である。

【符号の説明】

1 エキゾーストマニホールド

2 a, 2 b, 2 c, 2 d 枝管

2 e 収納部

3 触媒

10 3 a 凹部

4 中央触媒

5 バルブ

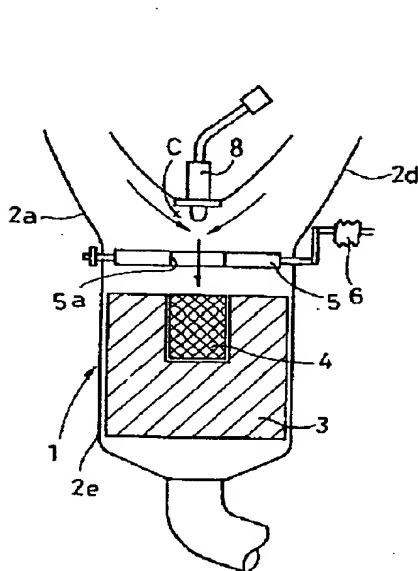
5 a 中央孔

6 アクチュエーター

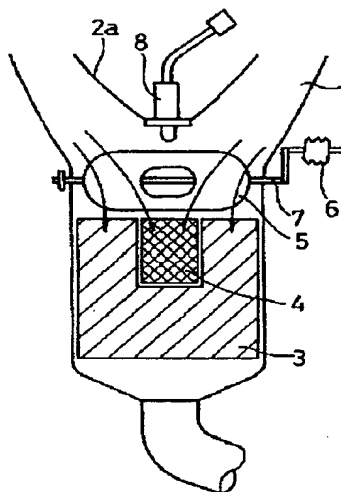
7 シャフト

C 集合部

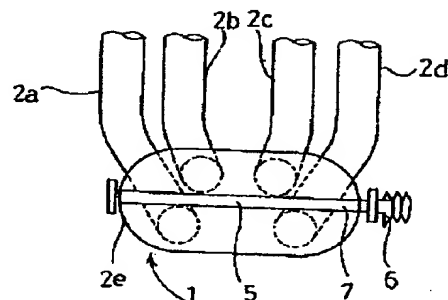
【図 1】



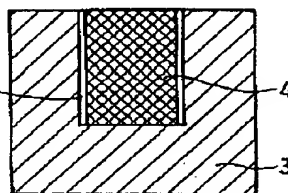
【図 2】



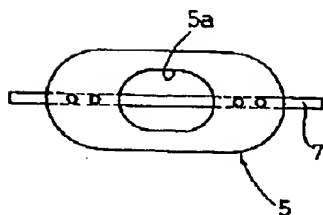
【図 3】



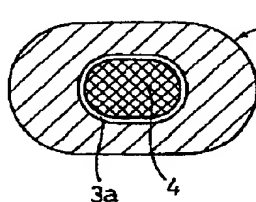
【図 6】



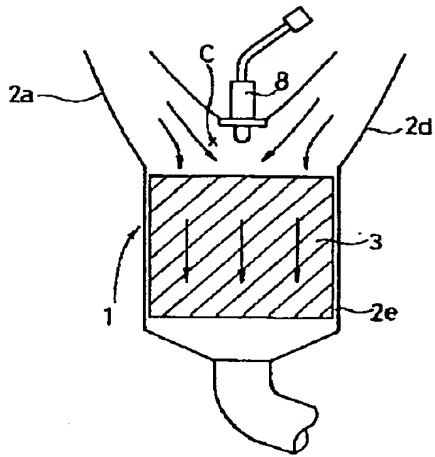
【図 4】



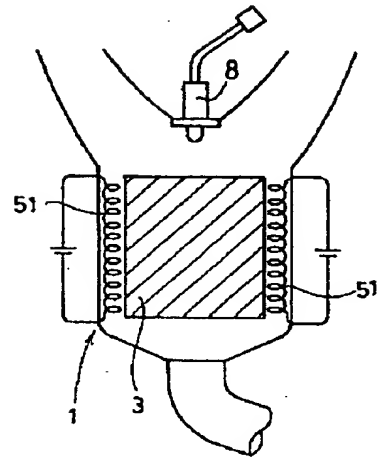
【図 5】



【 図 7 】



【 図 8 】



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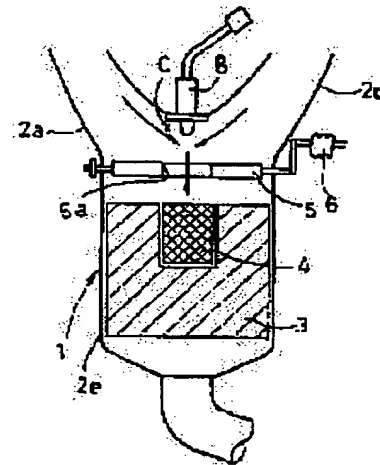
(72)Inventor : OIWA HIROYUKI

## (54) EXHAUST MANIFOLD

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To activate a catalyst rapidly, and improve purifying performance by arranging a valve having a center hole on an upstream side of the catalyst in an exhaust manifold freely to open and close, and arranging a center catalyst having fine cell density on the center part of the catalyst.

**SOLUTION:** A valve 5 provided on a part of a muffler part C upstream from a catalyst 3 is formed on a center part by penetrating a center hole 5a, and is constituted freely to open and close in an exhaust manifold 1. A center catalyst 4 having a fine cell density of a carrier arranged in a fitting condition arranged in a recessed part 3a formed upstream from the catalyst 3, and the center hole 5a, are arranged on a center part matched with each other. Since exhaust gas which is collected from each cylinder of an engine in the muffler part C, collides with the vicinity of the muffler part C in the way of passing the center hole 5a at the time of closing the valve 5, an exhaust temperature is raised, and the exhaust gas collides with the center catalyst 4 concentrically. It is thus possible to improve purifying performance of exhaust gas since the center catalyst 4 is reacted rapidly and is activated in an early stage.



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**CLAIMS**

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[Claim(s)]

[Claim 1] The exhaust manifold characterized by preparing a central catalyst with a fine cel consistency in the center section of said catalyst while preparing in the upstream of said catalyst in the exhaust manifold which comes to carry out the interior of the catalyst possible [ closing motion of the bulb which has a central hole ].

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## DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to amelioration of an exhaust manifold.

[0002]

[Description of the Prior Art] Conventionally, as an exhaust manifold shown in the schematic diagram of drawing 7, the interior of the catalyst 3 is carried out into stowage 2e formed in the downstream of the branch pipes [ 2a and 2d ] set section C. In the set section C, it is O<sub>2</sub>. Once the sensor 8 is formed and the exhaust gas from each cylinder gathered in the set section C, It is constituted so that it may be spread before a catalyst 3 and may pass through the inside of a catalyst 3. Conventionally with structure Since it was constituted so that exhaust gas may continue throughout said catalyst 3 uniformly and may hit, the temperature rise of a catalyst 3 took time amount, catalytic activity became late, and there was a trouble that the purification engine performance of exhaust gas was inferior. In addition, although the thing of structure which formed heaters 51 and 51 in the periphery of a catalyst 3 also existed as shown in drawing 8 in order to activate said catalyst 3 at an early stage, with such structure, in order that it might be hard to obtain a heating value to the extent that a catalyst 3 is activated for a short time and it might operate a heater 51, it required great quantity of electricity, and had the trouble that the whole will become large-scale equipment.

[0003]

[Means for Solving the Problem] While preparing possible [ closing motion of the bulb which has a central hole in the upstream of said catalyst in the exhaust manifold to which the summary comes to carry out the interior of the catalyst for the purpose of what the exhaust manifold which can think out this invention in view of the above-mentioned conventional trouble, can be made to be able to activate a catalyst quickly, and can raise the purification engine performance is not offered for ], it is having prepared the central catalyst with a fine cel consistency in the center section of said catalyst.

[0004]

[Example] Hereafter, the example of this invention is explained based on a drawing. Drawing 1 is the outline block diagram of an exhaust manifold 1, and the upstream of an exhaust manifold 1 forms branch pipe 2a connected to the gas column of each engine, 2b, and 2c and 2d. It gathers in the set section C and each branch pipe 2a, 2b, and 2c and 2d are O<sub>2</sub> in this part. Although it is that in which the sensor 8 was formed and has become that by which the interior of the catalyst 3 was carried out into stowage 2e of that downstream As the bulb 5 formed in the part of said set section C of the upstream of this catalyst 3 possible [ closing motion ] in this example and a bulb 5 shown in the plan of drawing 4 By rotating the shaft 7 which penetration formation of the central hole 5a is carried out, and was connected to the center section through an actuator 6, it is constituted so that it can open and close within an exhaust manifold 1. [0005] Moreover, as been the plan of drawing 5 at the top-face side of the catalyst 3 in this example and shown in the expanded sectional view of drawing 6 Crevice 3a is formed and it has become that by which the central catalyst 4 was established in the shape of insertion in this crevice 3a. This central catalyst 4 was formed in the structure which made the cel consistency of support fine, and central hole 5a of this central catalyst 4 and said bulb 5 was arranged at the mid gear to adjust.

[0006] Although the exhaust gas discharged from each engine gas column gathers in the set section C through branch pipe 2a, 2b, and 2c and 2d in such structure Since the closedown of the bulb 5 is carried out in the state of drawing 1, exhaust gas tends to pass central hole 5a, and it will collide to near the set section C, and an exhaust-gas temperature will rise by collision, central hole 5a is passed, and exhaust gas collides with the central catalyst 4 intensively. The central catalyst 4 with a fine cel consistency will react

quickly by this, the central catalyst 4 will be activated at an early stage, this will purify exhaust gas at an early stage, and the purification engine performance will improve. Therefore, also at the time of inactive, the central catalyst 4 is activated at an early stage, and a catalyst 3 can attain the good purification engine performance at an early stage.

[0007] moreover, when the temperature of a catalyst 3 also rises and a catalyst 3 is activated As shown in drawing 2 , a bulb 5 is opened through an actuator 6. In the state of this drawing 2 In order that a bulb 5 may stand up to the flow direction of exhaust gas, as shown in the plan of drawing 3 , a bulb 5 serves as a bridgewall. It becomes what can prevent a mutual interference in the set section C of the exhaust gas discharged through branch pipe 2a, 2b, and 2c and 2d from each engine gas column like drawing 3 good. In the set section C, the collision of exhaust gas is eased, an exhaust loss becomes very small, in order that exhaust gas may continue throughout the catalyst 3 of the downstream along with a bulb 5 and may pass through the whole region of a catalyst 3 in homogeneity, exhaust gas hits a catalyst 3 uniformly and its purification engine performance improves.

[0008] Therefore, at the time of inactive [ of a catalyst 3 ], carry out the closedown of the bulb 5 like drawing 1 , and exhaust gas is made to collide in the set section C in this example. While the temperature of exhaust gas can be raised, being able to pass central hole 5a, being able to apply exhaust gas to the central catalyst 4, being able to activate the central catalyst 4 at an early stage and being able to make exhaust gas purify At the time of the activity of a catalyst 3, a bulb 5 can be opened like drawing 2 , interference of the exhaust gas from each gas column can be prevented, an exhaust loss can be reduced, the fall of an engine output can be prevented, exhaust gas can be uniformly applied to the whole region of a catalyst 3, and the purification engine performance can be raised.

[0009]

[Effect of the Invention] While preparing the exhaust manifold of this invention in the upstream of said catalyst in the exhaust manifold which comes to carry out the interior of the catalyst possible [ closing motion of the bulb which has a central hole ] By having prepared the central catalyst with a fine cel consistency in the center section of said catalyst At the time of inactive [ of a catalyst ], close a bulb, and exhaust gas is centralized on a central hole. Exhaust gas can be intensively applied to a central catalyst, a central catalyst can be activated at an early stage, and exhaust gas can be made to purify good. Moreover, it has the effectiveness which can apply exhaust gas to the whole region of a catalyst uniformly where it opened the bulb at the time of the activity of a catalyst and an exhaust loss is reduced, and can raise the purification engine performance.

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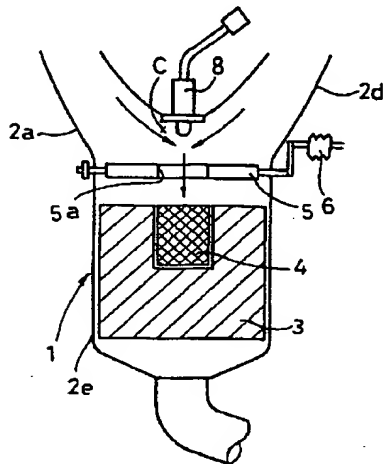
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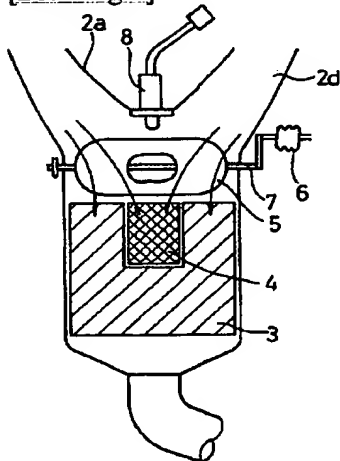
DRAWINGS

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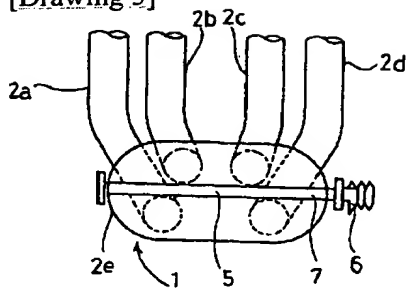
[Drawing 1]



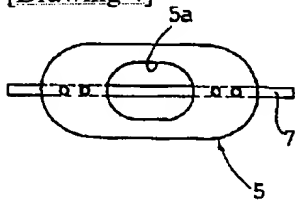
[Drawing 2]



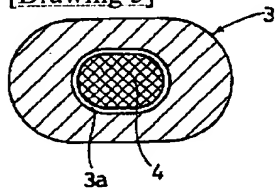
[Drawing 3]



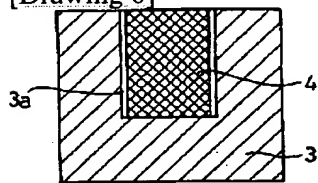
[Drawing 4]



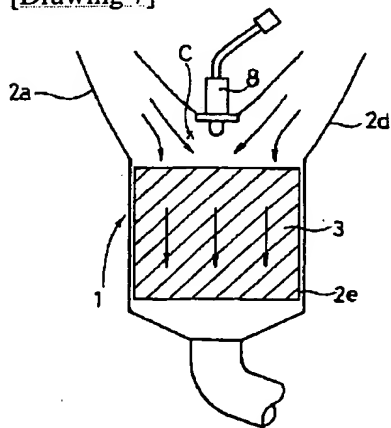
[Drawing 5]



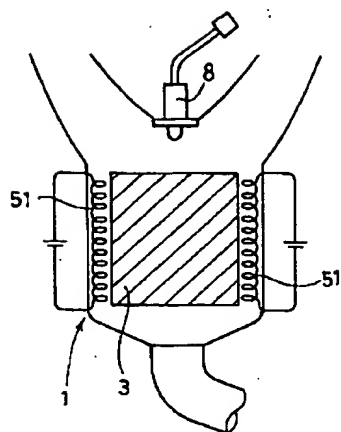
[Drawing 6]



[Drawing 7]



[Drawing 8]



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[Translation done.]

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